Cognitive Capitalism as a Financial Economy of Production

Fumagalli, Andrea and Lucarelli, Stefano
Università di Pavia, Università di Bergamo

September 2008

FOURTH BI-ANNUAL CONFERENCE
"THE FINANCIAL AND MONETARY CRISIS: *Rethinking Economic Policies and Redefining the architecture and governance of international finance"*

Université de Bourgogne, Laboratoire Economie Gestion
Dijon, France

DECEMBER 10-12, 2009

COGNITIVE CAPITALISM AS A FINANCIAL ECONOMY OF PRODUCTION

Andrea Fumagalli[*] *and Stefano Lucarelli*[♣]

> It is interesting that the stability of the system and its sensitiveness to changes in the quantity of money should be so dependent on the existence of a variety of opinion about what is uncertain. Best of all that we should know the future. But if not, then, if we are to control the activity of the economic system by changing the quantity of money, it is important that opinions should differ. Thus this method of control is more precarious in the United States, where everyone tends to hold the same opinion at the same time, than in England where differences of opinion are more usual.
>
> John Maynard Keynes, *The General Theory of Employment, Interest and Money*, chapter 13, 1936.

1. Introduction

The structural changes that occurred in the last 30 years have substantially modified the capitalistic organization of society, both at national and international level.
In order to understand the evolution of social and economic systems it is necessary to focus on the relations of production, that is on those social relationships that explain the valorisation process. Since the economic crisis of the 1970's until the late 1990's the structure of production in the

[*] Department of Economics, University of PaviaVia San Felice 5, 27100 Pavia: E-mail afuma@eco.unipv.it
[♣] Department of Economics "Hyman P. Minsky", University of Bergamo, Via dei Caniana 2, 24127 Bergamo: E-mail: stefano.lucarelli@unibg.it

developed countries has been characterised by the development of highly flexible forms of production. The organizational revolution that occurred within production activity has been achieved through introducing new information technologies and restructuring of production within increasingly wider territories.
A new regime of accumulation devoid of a stable mode of regulation and centred on financial valorisation of new socio-economic growth perspectives has been consolidating. Conditions imposed by financial markets in order to create the shareholder's value consisted of promoting downsizing, reengineering, outsourcing and *Merger & Acquisitions* processes (*M&A*). The flexibilization of labour force and precarization of existence has thus been the result of the established valorization norm. But why should the corporate restructuring sustain the enterprise value by creating income stock ?
In order to answer this question it is necessary to analyse the importance of knowledge in the production process. For this purpose, we shall use some categories of the so called French Regulation School. The definition of a new regime of accumulation involves a research on the criteria of valorisation and the prevailing technological paradigm. The main changes of new capitalism concern mainly two spheres: the role played by knowledge in the new technological paradigm and valorisation process and the importance of finance. The dominant technological paradigm and the role played by knowledge within it are not enough to explain the evolution of the accumulation regime. It is needed to introduce further elements necessary to explain the expectations that sustain the investment choices made by capitalists; these are the conventions or collective beliefs[1].
Then, after describing the main features of the accumulation paradigm that many scholars have not hesitated to name as *Cognitive Capitalism* (henceforth CC)[2], we shall attempt to provide a theoretical framework of it intended as a financial economy of production. We shall therefore proceed to the reformulation of the schemes of monetary circuit[3] by taking into account the structural changes induced by CC.

2. The main features of Cognitive Capitalism

2.1 A critique of the liberal theories of knowledge-based economy

CC is a *regime* of accumulation without a viable mode of regulation between entrepreneurs and workers as regards knowledge exploitation and capital gains allocation. On the demand side, the increasing polarization of income distribution - in absence of suitable welfare policies - risks to penalize not only aggregate demand, but even knowledge-learning process and network economies. A too high share of precarious works can negatively affect social productivity, with the risk to worsen financial gains. On the contrary, a constant realization of capital gains and their fair allocation provided by financial markets should guarantee a stable growth of CC [Fumagalli and Lucarelli 2007].
The hypothesis of CC develops from a critique of the political economy of the new liberal theories of knowledge-based economy.

[1] Orléan 2008.
[2] Corsani et alii 2001, Azais, Corsani, Dieuaide 2001, Vercellone 2003, 2005, 2006, Fumagalli 2007, Moulier-Boutang, 2007, Fumagalli and Vercellone (edited by) 2007, Colletis and Paulré 2008.
[3] Graziani 2003.

Understanding of the meaning at stake in the current mutation of capitalism cannot be reduced to the mere constitution of an economy founded on knowledge, but in the formation of a knowledge-based economy framed and subsumed by the laws of capital accumulation.[4]

The notion of CC has also been developed as a response to the insufficiency of the interpretations of the current mutation of capitalism in terms of the transition from a Fordist to a post-Fordist model of flexible accumulation.
David Harvey has defined flexible accumulation paradigm by a direct confrontation with the rigidities of Fordism:

It rests on flexibility with respect to labour processes, labour markets, products, and patterns of consumption. It is characterized by the emergence of entirely new sectors of production, new ways of providing financial services, new markets, and, above all, greatly intensified rates of commercial, technological, and organizational innovation. It has entrained rapid shifts in the patterning of uneven development, both between sectors and between geographical regions, giving rise, for example, to a vast surge in so-called 'service-sector' employment as well as to entirely new industrial ensembles in hitherto underdeveloped regions […] it has also entailed a new round of what I shall call 'time-space compression' […] in the capitalist world - the time horizons of both private and public decision-making have shrunk, while satellite communication and declining transport costs have made it increasingly possible to spread those decisions immediately over an ever wider and variegated space.[5]

This vision is not completely exhaustive and may lead to distorted political implications: the knowledge economy has been a central element of the Third way, pinpointing the role of public intervention for education and new information technologies: knowledge economy seems, to the optimists, to be a nicer kind of capitalism, an 'opportunity economics', a new economic egalitarianism that was truly dependent on 'exploiting the potential of all'.
An opportunity economics would be one that frees opportunity for individuals to grasp, and gives them the means with which to realise their inherent potential:

The Third way's notion of emancipation is this notion of everybody's freedom to fully realise their potential – of 'bridging the gap between what we are and what we have it in us to become'. However, emancipation does not seem to be the dominant feature of what the knowledge economy brings. There is sufficient critical analysis of the postfordist production order to point to the possibility that while it might hold the potential for emancipation for some, it also brings about new forms of exploitation for others, a relationship that is obvious and yet still poorly understood. […] Clearly, contemporary social democracy does not speak of capitalism as a system of the exploitation of labour in the interest of capital, or at least, New Labour doesn't, while there are varieties of this in social democratic discourse. The Third way denies, in fact […] that a distinction between labour and capital can be made in knowledge capitalism, since labour *is* capital.[6]

The category of post-Fordism model of flexible accumulation appears to be inadequate for comprehending the real transformation of the antagonistic relation of capital to labour related to the development of an economy founded on the driving role of knowledge. The notion of CC aims to overcome these difficulties by explaining the formation of a knowledge-based economy framed and subsumed by the laws of capital accumulation.
To deeply comprehend the role of knowledge in the evolution of capitalism we need to re-read the history of workers. Let us consider the case of Italian economic boom: the starting point for the formation of CC is the process of diffusion of knowledge generated by the development of mass schooling and the rise of the average level of education. The experiences of the *new employees* were radically different from those of the previous generations of individually unskilled workers. The intellectual quality of the labour force led to the assertion of a new primacy of living knowledge,

[4] Vercellone 2007: 2.
[5] Harvey 1990: 147
[6] Andersson 2006.

mobilized by workers, in contrast to the knowledge incorporated in fixed capital and the managerial organization of firms[7].

When between 1978 and 1979 the so-called 'new employees' walked into Mirafiori (a FIAT factory), their experiences were radically different from those of the previous generation of workers, who were 'individually deskilled, neo-immigrants and new to city living, yet socialised en masse in this highly mechanised "factory"' (Alquati 1975). They would rise up against both the wage 'structure', its 'form' and the necessity to work for the whole duration of one's life itself, to receive an income rather than a salary [see Citizenship income]. The subjectivity expressed by this new labour force certainly failed to undermine the factory regime overall. If anything, it made it more viable and eased the restructuring moves towards flexibility. This is due to the rigidity of the offer of labour caused by the rising levels and spread of education. Whilst it had been previously possible to interpret the productive behaviour of the labour force as an articulation of the technical composition of class, now this was made impossible by the growing penetration of the 'social' into the productive sphere, which limited its normative power over the behaviour of the workers (Berra and Revelli 1979). 1977 had entered the factory.[8]

The subjectivity expressed by this new labour force failed to undermine the factory regime overall and yet it eased the restructuring move towards flexibility: it means that the process of wealth creation is no longer based upon homogeneous and standardized scheme of labour organization.
Whereas within the Fordist factory productive activity is mute, and work is performed by a silent human chain, in the post-Fordist metropolis, the material labour process can be empirically described as a complex group of linguistic acts, a sequence of assertions, and a symbolic interaction. This is because labour activity is now performed alongside the system of machines, with regulating, surveillance and coordinating functions; but also because the process of production uses knowledge, information, culture and social relations as its "raw materials"[9].

2.1.1 The life cycle of knowledge

The generation of knowledge and its spatial diffusion through learning and network processes are the basic features of CC. The life cycle of knowledge comprises three phases: from tacit to codified, to exploited codified knowledge[10]. The socialization of tacit knowledge occurs *via* a slow and expensive process entailing the sharing of personal experiences and social context. Whilst tacit knowledge holds out the specialised learning economies, the development of industrial production needs that part of tacit knowledge is formalised in abstract codes[11]. The process of codification depends on organisational decisions and behaviours. The codes can be used as means of appropriation: a high degree of *routine* can represent a precondition for perpetrating expropriation and codification of workers tacit knowledge[12]. Knowledge of organisations resides in routines that are also "a locus of conflict, governance and way of codifying microeconomic incentives and constraints"[13].
If important tacit knowledge cannot be effectively spread through an organization, it means that training in an organization becomes more time consuming.
In order to collectivize and spread tacit knowledge, organizations should invest greatly in the human capital of their members by offering high wages. But there is another important variable: education. Education inside the society may represent a form of social control.

[7] Vercellone 2006.
[8] Zanini and Fadini 2001.
[9] Virno 2001: 181.
[10] Fumagalli 2007.
[11] Becattini and Rullani 2000: 105.
[12] Cassi [2007: 76] defines a *code* as a *set of signs and symbols with a pre-determined, accepted meaning and some rules to combine them*; he also points out that "sharing a code is necessary but not sufficient condition for an effective communication among agents … The institutional and social context shapes the feature of knowledge in terms of non-excludability and non-rivalry" [*ibidem*: 79].
[13] Coriat and Dosi 1998, quoted in Cassi 2007: 78.

Orthodox treatment of education have been dominated, however, by references to codifiable knowledge. This can be seen below, for example, in the central role given to targets (for literacy, numeracy and so on) in New Labour policy towards primary and secondary schools. Targets are premised on knowledge that can be codified.[…] Tacit knowledge points away, therefore, from a classroom environment.[14]

If knowledge is the basis of accumulation, it becomes unavoidable to analyze how its exchange and diffusion affect the dynamics of productivity. It is reasonable to assume that the greater is the share of codified knowledge dedicated to the accumulation activity, the higher is the achievable level of social productivity. The ability to enlarge both knowledge-learning process and network economies, respectively, depend on the degree of *cumulativeness*, *opportunity* and *appropriability*[15] and on the level of income and positive externalities. When knowledge-learning process is constrained by intellectual property rights (IPR), we shall see that the consequence is that the greater is the degree of *appropriability* of knowledge, the smaller becomes its capacity of diffusion – affecting, *de facto*, its ability to positively influencing the associated productivity.
To a higher level of knowledge corresponds, in terms of its generation and diffusion, more *potential* innovative technologies.
It may be useful define innovation in economic sense: from a systemic perspective, an innovation is a change in the economic process occurred as a result of the investment activity.
Whether the investment is devoted to the already existing technology or to new technologies will establish the amount of innovation.

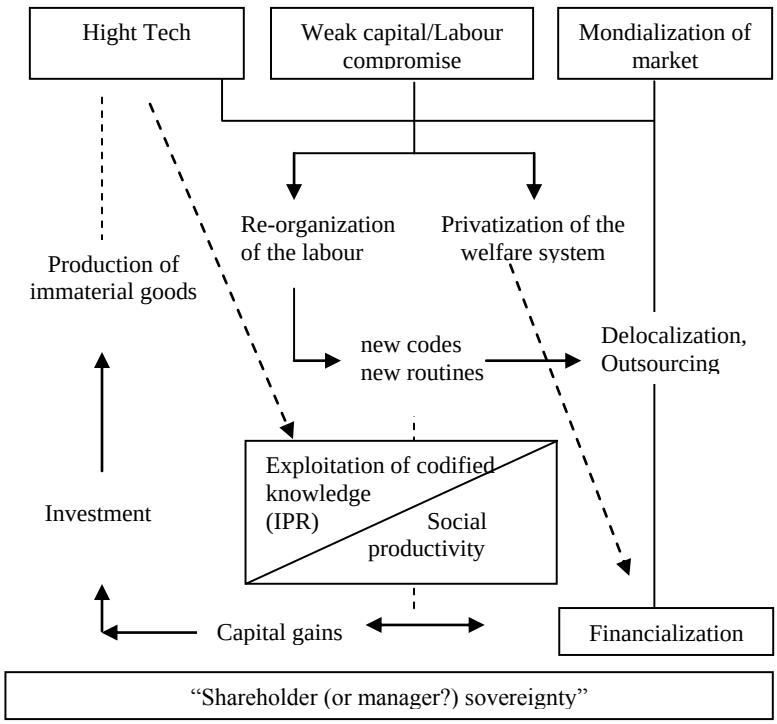
2.2 Investment activity and the Internet convention

The crisis of Fordism led to a new investment activity based on new sources of growth: electronic marketing, informational goods, encoding software, control over the quality of information, branding, control over the lifestyles, etc. Then social system is geared around innovation and immaterial production and investment policies depend not only upon R&D, but also "learning by doing" strategies and process. But in CC the impact of new ICT based on computer science, micro-electronics and the new organizational productive changes (just-in-time, zero stock) *have speed up* the "learning by doing" processes, spreading them well beyond the firm[16]. At the same time, part of the R&D process unfolds itself within territories each having one or more specific competencies. Where to locate economic activities is mainly determined by the search on the part of the firm of advantages in the development of its competencies[17]. Consequently the productivity entailed by the exchange of knowledge cannot be assimilated to material productivity. High Tech production systems define organisational decisions and behaviours and indirectly both the process of codification of knowledge and the exploitation of codified knowledge.
Investment is a primary source of productivity increases and it may be split in two parts:
1) *routine* investment;
2) investment in innovation, knowledge (learning and human capital) and *branding*[18]. These are investments that are used to produce and subsume the value produced outside the directly productive processes.

[14] Prabhakar 2002: 44.
[15] Nelson and Winter 1982.
[16] Venturini 2006.
[17] Mouhoud 2006: 300.
[18] Adam Arvidsson [2007] delineates the ideal-typical model of what he calls the "logic of the brand". He argues the logic governing how brands create value, represents a paradigmatic example of the dominating value-logic of informational capitalism. Value is less based on the control of salaried labour and more on the ability to appropriate and commodify a socially produced immaterial externality. This externality consists in forms of knowledge; sociality and affect that arise in (relatively) autonomous processes of media enhanced sociality. It is the new empowered capacity to create what I call an "ethical surplus" that result from new information and communication technologies, that

Routine investment traditionally depends on demand expectations and on realized production level in the previous period.
Investment in innovation and knowledge is characterized by very high potential returns and, at the same time, by possible catastrophic losses. In CC they represent the most relevant part of the firm's strategies. Whilst the investments in production and transmission of knowledge (education, training, R&D, management, that is immaterial goods) increase, there is a significant reduction of the costs of codification, transmission and acquisition of knowledge, due to the generation and diffusion of linguistic and communicative technologies (ITC, Internet, and the like).
Not only knowledge has became an increasingly mobile resource, but also, and above all, better codify-able[19], and therefore directly exploitable via IPR. In a context where the exploitation of knowledge is the final goal, the labour market becomes even more fragmented as a result of the shift from mechanical-repetitive to linguistic-communicative technologies (the so called high tech) where both quality and modality of the performed work are irreversibly modified. It allows the exploitation of individual knowledge and relational skills and generates technological unemployment and work precariousness.
Vis à vis the levels of remuneration, this process has led to the individualization of wages accompanied by a wage dynamics even more disjointed both from productive gains and working hours. At the same time, increased quotas of postponed salary are expropriated, as a result of the tendency to privatize the Welfare system (Figure 1).

Figure 1. *High Tech production systems (Internet convention)*



In the 1990s, financialization, in as much investment of the collective savings in the stock market,

constitutes the real foundation for the wealth that brands valorise. Arvidsson suggests that the logic of the brand is applicable to a range of other socialized production processes, from the ethically conscious company to the contemporary participatory online economy, or Web 2.0.
[19] Rodriguez 2000, Rullani 2004.

generated additional incomes. The incomes were created in the markets through business debt to the banking system.[20] In the period between 1993-2000, the New York Stock Exchange upwardly exploded (the Dow Jones from 4000 to 11700, Standard & Poor's from 450 to 1530): the appreciation obtained in the market favored real growth thanks to the exploitation of the knowledge and productivity of labour involved in the high-tech sector above all. The valuation of financial markets began to depend on the organizational change geared toward favoring innovative cooperative forms between relatively autonomous workers. The dynamism of the organizational change became – thanks to the attention that the financial markets gave it – a new modality of valorization of productive capital. Thus a finance-led growth regime asserted itself[21] . In the second half of the 1990s, the idea of a digitalized society, with liberating effects on the world of work and life, became a convention[22]. Whether true or false, there is no doubt that this convention pulled the *real* transformation processes of the world ahead. Joseph Stiglitz's lucid critique of the roaring '90s confirms this:

> Modern American-style capitalism was pivoted around what would later be called the New Economy, symbolized by the so-called dot-coms that were revolutionizing the way that America – and the rest of the world – did business, modifying the rhythms of the very technological shifts and increasing the growth rate of productivity to extraordinary levels, that had not been seen for over 25 years. […] Halfway though the '90s, the manufacturing sector had slipped to a scarce 14% of total production, with a precent of employees even lower in respect to the active population.[23]

A convention determines more than just the definition of a "scenario of reference":

> We must go further, and also consider the battery of specific criteria it constructs to serve as a basis for the concrete valuation of companies. Thus, in the case of the "New Economy convention", faced with the difficulty of accounting for stock market prices solely on the criterion of profits, as most 'dot.com' businesses were loss-making, a new basis for making estimates appeared, in the form of "value per user". So the potential number of subscribers, visitors or customers was adopted as the strategic variable, supposed to enable the level of value creation to be assessed.[24]

In this accumulation system, various forms of remuneration tied to the whole of business yield developed: not only stock options for managers, but also the very retirement or investment funds that mostly involve wage labourers. These forms of remuneration made financial market liquidity grow but, in the absence of an adequate redistribution rule, inside a capitalism in which the rule is to command living labour in any case, this also compressed wages, leading to systemic instability. This is what happened in the March 2000 crisis: beyond having distributed new stock incomes unequally, the command bridge of the New Economy made them by destroying wages and employment stability, in line with a new common sense: the conditions over financial markets to create stock value encourage extreme organizational innovation, promoting the processes of downsizing, reengineering, outsourcing and *M&A*. Hence, finance translates and betrays the real innovative processes in act by devaluating living labour. To attract investors to the stock markets,

---

[20] The disinvestment in fiscal capital that freed up liquidity from productive processes should be taken into account. This liquidity was used to increase the market value of capital. If in addition to the increase in liquidity, consequent to the reduction of investments in fixed capital, the increase of business debt to the banking system is added, we can understand why the financialization of the economy (payment of dividends, interest, Merger & Acquisitions, the buyback of already exposed stocks) was an extraordinary transfer of wealth to the class of stock investors and the managers the were responsible for financialization processes. On this point see Marazzi 2008.

[21] Boyer 2000.

[22] Marazzi 2008.

[23] Stiglitz 2004: 4.

[24] Orlean 2008. Following Keynes, André Orlean [2004] proposed a definition of "collective belief" that is essential for studying financial markets: an individual *i* believes that the group *G* believes the proposition *Q* if he believes that, in the majority, the members of the group believe that the group *G* believes *Q*. The definition is "self-referential", it does not involve any reference to the "primary beliefs" of individuals, but only refers to beliefs that bear directly on what the group *G* believes. The self-referential hypothesis therefore reconciles the *ex ante* existence of a heterogeneous set of individual fundamentalist estimates and the *ex post* emergence of a unique representation that gives the price its significance.

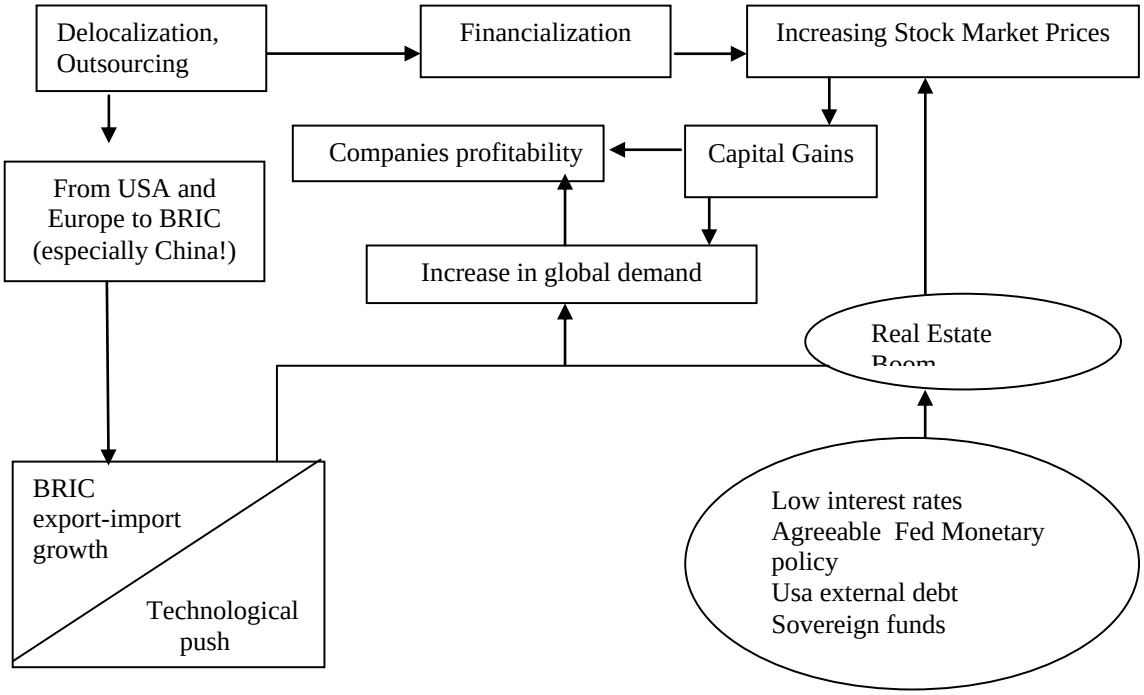
businesses offered increasingly higher yields precisely through merger and acquisition operations of other businesses, acquiring their own shares, and even rigging their accounts. The necessary capital for this restructuring aimed at controlling the technological trajectory was done by taking remuneration from the work force.
The March 2000 crisis marked the passage toward another diffusion and generalization of financialization: a new phase characterized by a marked decline, with losses of 40% in the Dow Jones, 50% in Standard & Poor's and 80% in the NASDAQ. In the meantime, wage deflation advanced, under the effects of the Asian (Indian and Chinese) industrial army reserve but also put into action by outsourcing.

2.3. The Chinese and real estate convention

The market recovery came in 2003. Christian Marazzi has talked about this as the "China convention"[25]; a convention – which, in our opinion, should be understood as a change on the margins of the internet convention – that rests on the idea that valorization depends on the outsourcing towards developing countries with a high exploitation of labour and the environment, but still within the same technological paradigm. This triggered a mechanism that could be defined as an industrial reserve army of financial origin. The financial crisis of march 2000 is the first one after 1987 which involved the western stock exchanges, a new convention raised up. It deals with the increasing role played by China, India and other newly developed countries (like Brazil and Russia, but also South Africa and the so called Asian tigers[26]) in the internationalization of production and cognitive division of labour (Figure 2). From an institutional point of view, the "China convention" started to work after the entrance of the Republic of China in the Wto in December 2001. The role played by China in dragging the world economy is quite known in this decade. The increasing Chinese export, especially towards the western economy, characterized by low prices, favored the stabilization of inflation rates and the diminishing of real interest rates. Stock exchanges market were able to recover after the internet convention crisis and to provide liquidity to the speculative activity, even thanks to the increase of indebtedness of American and western families, in order to keep up with the living standard of the previous decade. Chinese surplus started to finance the USA internal and external deficit[27].

[25] Christian Marazzi, "Dietro la sindrome cinese", in "Il manifesto", 1 July 2004.
[26] Jim O' Neill, global economist at Goldman Sachs, argues that the economic potential of Brazil, Russia, India, and China (BRIC) is such that they may become among the four most dominant economies by the year 2050. These countries encompass over 25% of the world's land coverage and 40% of the world's population and hold a combined GDP (PPP) of 15.435 trillion dollars. On almost every scale, they would be the largest entity on the global stage. Goldman Sachs Global Economic Group, *BRICs and Beyond*, 2007, http://www2.goldmansachs.com/ ideas/brics/book/BRIC-Full.pdf.
[27] At November 2008, China is the first country which finance Usa public and foreign deficit, surpassing Japan after 2005.

Figure 2. *Chinese and real estate conventions*



In the two-year period following the March 2000 crisis (2001-2002), the FED drastically lowered the interest rate from 6% to 1%. That pushed the economic agents to go into unreasonable debt to benefit from the discrepancy between their own capital yield and the interest rate. This incentive to accumulate debt means that the wealth-effect was articulated in different ways in respect to the roaring years of the New Economy: the prices on real-estate markets rose and the FED's monetary policy supported the buying power of American consumers. American families could thus obtain practically unlimited credit from the banking system, putting up a real-estate patrimony with increasing value as a guarantee. The expected earnings came back high, sustained by a negative real interest rate. Stock prices came back up in March 2003 (at the eve of the American intervention in Iraq). It is possible to find a precise description of financialization as practice of social control in the words of Stiglitz:

The story goes back to the recession of 2001. With the support of Federal Reserve Chairman Alan Greenspan, President George W. Bush pushed through a tax cut designed to benefit the richest Americans but not to lift the economy out of the recession that followed the collapse of the Internet bubble. Given that mistake, the Fed had little choice if it was to fulfill its mandate to maintain growth and employment: it had to lower interest rates, which it did in an unprecedented way – all the way down to 1%.

It worked, but in a way fundamentally different from how monetary policy normally works. Usually, low interest rates lead firms to borrow more to invest more, and greater indebtedness is matched by more productive assets.

But, given that overinvestment in the 1990's was part of the problem underpinning the recession, lower interest rates did not stimulate much investment. *The economy grew, but mainly because American families were persuaded to take more debt, refinancing their mortgages and spending some of the proceeds.* And, as long as housing prices rose as a result of lower interest rates, Americans could ignore their growing indebtedness.[28]

[28] Joseph Stiglitz, *America 's Day of Reckoning*, http://www.project-syndicate.org/commentary/stiglitz90, August 2007, our emphasis.

In other words, the population was involved in the production of (financial) wealth, first through the construction of the New Economy, then – after the diffusion of a new swarm of innovations and innovative instincts that fed financial euphoria, but over time transformed into positional rents for only the most aggressive businesses – repositioning the financial level to the real-estate sector after having disciplined a euphoric society through outsourcing toward developing countries that highly exploit labour and the environment. Monetary policy facilitates this process without governing it: from Spring 2003 to January 2007 the FED extraordinarily increased the liquidity available to the markets. 97% of the American population hit by wage deflation – through which the devaluation of living labour is understood – continued to preserve its quality of life through rising real-estate prices, the generosity with which the American credit markets operated, and the low price of imported goods. Nevertheless, this financial lever sustained financial earnings without any relation with the capacity to generate profits in the "real" economy: insolvency risk was high. Credit of the same nature was grouped and converted into bonds and derived products that were put into financial markets. Thus risk was transferred to the operators of these financial activities, which increased bank solidity, but was susceptible to leading to a bigger crisis.
A positive effect on financial market begun to be developed by credit-debt relationship on housing market (the "real estate convention"), favored by low interest rates, financial innovations (new types of derivatives) and increase in the house prices. The convention has lasted until September 2007, after the first disease in the mortgage market.

2. 4 A finance-led capitalism?

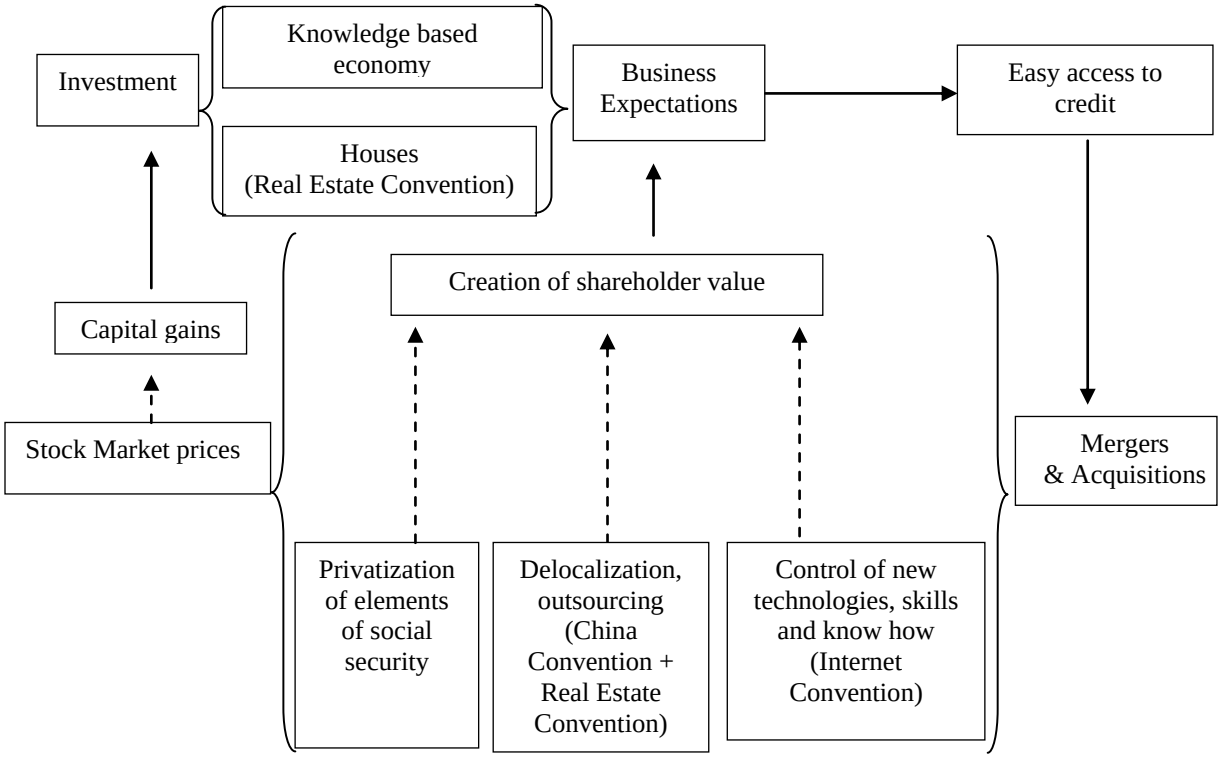
The previous analysis says that CC is not simply a stage of capitalism where knowledge assumes a new role after the transformations in the capital/labour relation. CC is a finance-led economy based on a particular theory of the firm – the so called *shareholder sovereignty theory* - that legitimates the shareholder control of the company[29]. To complete the analysis of the knowledge/power relation in the development of the division of labour we need to consider together new form of production and financialization. CC is mainly based upon the globalization of financial markets, utilized by the investors both for financing the economic activity and for stimulating investments via the increased financialization of the productive activities.
The dismantling of the Welfare system, favouring the growth of the quotas of income to be allocated to the financial market, shows the irrelevance of the intervention of the State in economy and the diminishing its regulatory and distributive role. The so-called 'Washington consensus', named after the Washington-based institution of the IMF and the World Bank has conquered the policy agenda in most countries, by providing the key policy justification for financing and supporting financial markets throughout the world.
The realization of production is compensated by financial markets acting as a *multiplier* of aggregate demand, and by the processes of globalization (delocalization, outsourcing, lower labour costs).
The efficiency of the system is assured by both the growth of financial markets – primary source of surplus distribution - and by massive processes of outsourcing and delocalization characterizing advanced countries (which are by definition the places where the accumulation of knowledge occurs more intensely).
The power of finance capital depends on its ability to impose the criteria of financial returns. Markets move in waves of conventions – internet, China, real estate market have produced

[29] Aglietta and Rebérioux, 2005: 1. The doctrine of shareholder sovereignty does not consider that, being dispersed, shareholders do not have the real means to exercise their sovereign control. But external and internal controls compensate for the shareholders' inability: externally auditors, financial analysts and rating agencies are responsible for accounting information for investors; internally, the board of directors assumes the task of re-establishing shareholders' real rights. Aglietta and Rebérioux [2005] demonstrates the logical contradictions of outside controls and the real collusion between management and market finance.

movements of public opinion that are historically determined to divert towards the objects of desire-investment. Conventions are never real; they have real effects on the economic growth, though. Conventions are market trends originated within the investors community according to a logic of self-referential rationality. Self-rationality has to be interpreted as a prodigious mechanism for amplifying rumours. Conventions are historically determined, that is they epitomize a high number of heterogeneous factors that contribute to determine the qualitative trends of market. Internet convention is based on diffusion of communication and information technologies at domestic level, on a feeling of unlimited development of digital market and the infinite power of interconnection.
Companies, in order to obtain liquidity for *M&A* run into debts. Through the *M&A* strategy the company controls technologies, skills and know-how of other potential competitors.
The crisis of financialization of cognitive and innovative labour occurred in March 2000 involves the impossibility to reproduce the virtuous circle of s*tart up* and *M&A* on the base of the ongoing influx of capitals in the USA. The loss of capital gains (of risk premium and goodwill) is compensated by reducing drastically workers' wage and through processes of delocalization and outsourcing – China and India represent extraordinary areas of low cost labour force that is ready to enter the global circuits of high-tech production. Those new strategies concerning the re-launch of financial markets take place by weakening the generation of workers, whose skills made the New Economy grow in the developed economies. New convention needs to sustain consumptions even in the presence of an income redistribution to the disadvantage of workers. Monetary policy of the Fed had to adapt itself to make this apparent contradiction possible. Between the end of 2000 and 2003 the maintenance of high levels of consumption had been assured by interest rates at 1%, therefore negative in real terms, set by the Fed[30]. This occurred thanks to the elimination of savings and the remortgaging for home-owners who chose it rather than facing the inflation of real estate value.
Thus, business expectations should increase, managers should sustain the positive dynamics of shareholder values on the one hand, and pay the debts to the banks, on the other hand. More importantly, indebtedness is not directed to capital expenditures, but it is a powerful means of satisfying the financial criteria of shareholder value (Figure 3).

[30] Asensio 2007.

Figure 3. *Finance-led growth*



Such a process requires specific monetary policies by a massive injection of liquidity and lowering of interest rates to prevent the emergence of financial bubbles[31]. Macro-economic changes depend entirely on monetary policy: the USA Fed has played a decisive role, averting deflation by bringing the interest-rate curve to very low levels over 2001-2008 period. The result is a massive transfer of corporate risk onto households, which thus saved company profitability[32].
But, as the US situation in the '90s shows[33], the financial boom has a double result: from one side, the positive dynamics of shareholder values favours the increase in aggregate consumption, from the other, because of its unequal allocation, leads to a distorted income distribution.

3. Monetary economy of production and financial economy of production: a comparison with the circuitist approach

3.1 The monetary circuit scheme in its original form (Graziani 1984)

Within the economic theories that have a descriptive function of economic reality in order to formulate analytical rules concerning its functioning, an important role is played by the so called theory of the monetary circuit. It is an analytical scheme embedded in Quesnay's *Tableau économique* and in Marx's reproduction schemes that fixes the conditions of reproduction of a given system. It is not necessary then to define functions that synthesize the behaviour of the agents. The monetary circuit schemes consist of a macroeconomic analysis based on social structure rather than on individual behaviour. As it occurs in the classics researches, the characteristic behaviour of each

[31] The term "bubble" describes a situation on which current stock market prices are no longer justified by future dividends.
[32] Aglietta and Rebérioux, 2005: 4.
[33] Aglietta, 2006: 11-14.

social group is not given by free individual choices but by the specific social location that therefore expresses itself in a functional distinction of the economic agents who play a well specific role in the economic process according to the class they belong to. According to the indications of Keynes (but also of Schumpeter and Wicksell), banks, enterprises and workers are the social groups to take into consideration while individual's behaviour is determined by the functioning conditions of the whole system.

In the traditional individualistic analysis (the neoclassical one) the economic process seems like a whole of simultaneous and multilateral exchanges that involve all agents in an equal way: money and credit have any other function but to allow agents to make their exchanges. Exchanges that took place in an hypothetical perfect competition market determine the prices producing both the subjective equilibrium of each agent (that is the maximization of utility or individual profit) and the objective equilibrium of market (i.e. equilibrium between demand and supply). Money, that makes exchanges easier while avoiding the drawbacks of barter, doesn't change market equilibrium, that is the quantity produced or relative prices. In case monetary circulation alters market equilibrium it means that there is something incorrect in the management controlled by monetary authorities. The whole relative prices can therefore be analysed even assuming that economy works without money whereas determining monetary prices is due only to the quantity of existing money.

The monetary circuit as social macroeconomic analysis rather considers modern economy as a monetary production economy and thereby it involves a completely different mechanism from that of a barter economy. Monetary economy means that all exchanges are settled in money and this raises immediately the problem of how money is created and introduced into the system. In modern economies, money is created by the interaction between banking and enterprises sectors and it is then made available for the latter through granting credit. Because just those who have money can enter the market, the decisions made by banks as regards to whom grant credit and also how much credit they wish to grant become crucial elements to the determination of the final equilibrium of the system. Creating money contributes thus to determine the quantity produced as well as the distribution of national income. The result is that money is never neutral.

First of all it is necessary to explain how money enters the economic circuit, who owns it and on which conditions:

1. In a capitalist economy, liquidity created by banks is loaned to enterprises.
2. Enterprises make use of liquidity to buy labour force and put into action the technical process of production.
3. When the production process is completed, enterprises sell their products and repay the loan.

Obviously an important point about such a description of capitalist mode of reproduction process is that categories and problems that have been removed by neoclassical equilibrium analysis re-emerge as being analytically crucial:

a) the classical concept of capital as monetary advance which allows for production process to take place is taken up: capital is not thus a result of abstention from current consumption but it rather represents the possibility to get a loan to start-up the production process;

b) there is not equality among economic agents. The distinction between those who have chances to get a loan and those who don't is simply an expression of the class structure of capitalist society;

c) workers are excluded from the decision-making process concerning the management of the production process: loan beneficiaries are the firms thereby it's them that manage the production process and therefore choose the technology involved in the process as well as the quantity they wish to produce and the nature of the product itself;

d) the acknowledgement that enterprises - by managing the production process - have the power to determine the nature and quantity of production brings about the abandonment of another theorem of the neoclassical theory, i.e., that in market labour workers can bargain the level of their wages in real terms. As a matter of fact, if bargainings are not simultaneous and labour and goods market are regarded as different markets any chance to concretely contract real wage fails since workers lack knowledge of the actual prices of goods until when they go to buy them;

e) in the neoclassical view, the issue of the realization of products and profits is not taken into account whereas in the view of the capitalist process as a monetary cycle the issue of such realization emerges again with all its implications concerning the distribution of income and the accumulation of capital (and the theory of value). This occurs not just because one or more agents can decide to accumulate liquidity and thereby interrupt the monetary circuit but especially because the enterprises, at the end of the production process, have to find adequate liquidity to pay off their loans including the agreed interest rates. Although this can happen, it is necessary that some conditions occur in order to solve the problem of the realization faced by the enterprises. Those conditions can be considered neither normal nor automatic: the monetary circuit in itself doesn't have endogenous elements that assure its equilibrium.

In the traditional version of the monetary circuit scheme[34] there are three classes (bankers, capitalists, and workers) and two sectors (producing consumption and investment goods). The capitalist production is described as a process characterized by sequential phases, the first one being the creation of money by banks. Firms set the amount of both the consumption and investment goods to be produced. The initial amount of credit that firms obtain from banks is less than the amount that they should pay back at the end of the period. Augusto Graziani, the founder father of the Italian circuitist approach, posed the problem since the early 1980s[35]. In France the circuit theory has been analytically developed by three main groups of authors: 1. the so-called Dijon school headed by Bernard Schmitt[36]; 2. the group headed by Alain Parguez, strictly connected to French-Canadian authors; 3. the group of Bordeaux, active mostly in the 1980s, formed around François Poulon.

i. The opening of the monetary circuit (initial finance)

The first step in the economic process is to found funding so that either the industrial or business entrepreneur comes into possession of the means of production and labour force necessary to start up his business activity. The trust relationship established between agents of goods and services markets is guaranteed by money in its function of credit money. Credit money enters the economic process under entrepreneurial demand. When industrial enterprises increase the flow of investments, money demand addressed to the banking sector is met through the ex novo money creation. The amount of money used to fund the production activity is not just endogenous in the demand side – since it varies according to the changes in the investment plans of the enterprises – but also in the supply side because it depends on the availability of monetary policy and the selecting and rationing criteria in force in the banking sector.

In the monetary circuit approach, the separation between banking and enterprise sector represents a fundamental characteristic of capitalism. Money is not neutral at all and it has direct consequences on the level of investments made by the enterprise sector and therefore on the final level of production. Money doesn't just affect the level of effective demand (as in Keynes' *General Theory*) but being the only means of funding it also heavily influences the productive activity of the enterprise sector, which is the effective supply.

ii. The production process

The production process lies at the heart of the capitalist economic system. Most of the existing social conflict due to the conflict of interest between entrepreneurs and workers lies in the transformation process of the factors of production into finished products. Such a distinction is mainly established by the opportunity for entrepreneurs to directly manage the production activity and to take initiative autonomously thanks to their free access to credit market, against the

[34] Graziani 1984.
[35] Realfonzo 2006, Fumagalli and Lucarelli (edited by) 2008.
[36] Rossi 2006.

subordinate role played by workers who passively have to express their willingness to work according to changing productive needs.
Particularly, the management of production techniques becomes a fundamental variable to explain the evolution of production dynamics aimed at the valorisation of goods produced and introduced into the market. Production plans chosen by entrepreneurs can be affected by two main economic factors:
1.the availability of liquid assets in order to fund new investments;
2.the expectations concerning the placement of products on the market aimed at the valorisation of production.
Thus it would seem that the only actual constraint for production activity is given by monetary conditions established by the banking sector. The risk of not selling all goods that have been produced represents a constraint that can be easily removed: enterprises have the opportunity to issue stocks and bonds and thus regain liquidity to pay off their bank debt.

iii. The closure of the monetary circuit

Here it's about analysing the problem of regaining the amount of liquidity that enterprises have spent. They have to be able to pay off not just the loan granted to them at the beginning of the production process by the banks but also the interests accrued over the same period of time. Issuing securities doesn't represent an authentic expenditure for enterprises. Because part of liquidity paid in the form of interests or dividends constitutes the income of the working class, it can be used to buy new consumption goods or other securities issued by the enterprises.

3.2. Description of the role played by financial markets in the traditional circuit schemes.

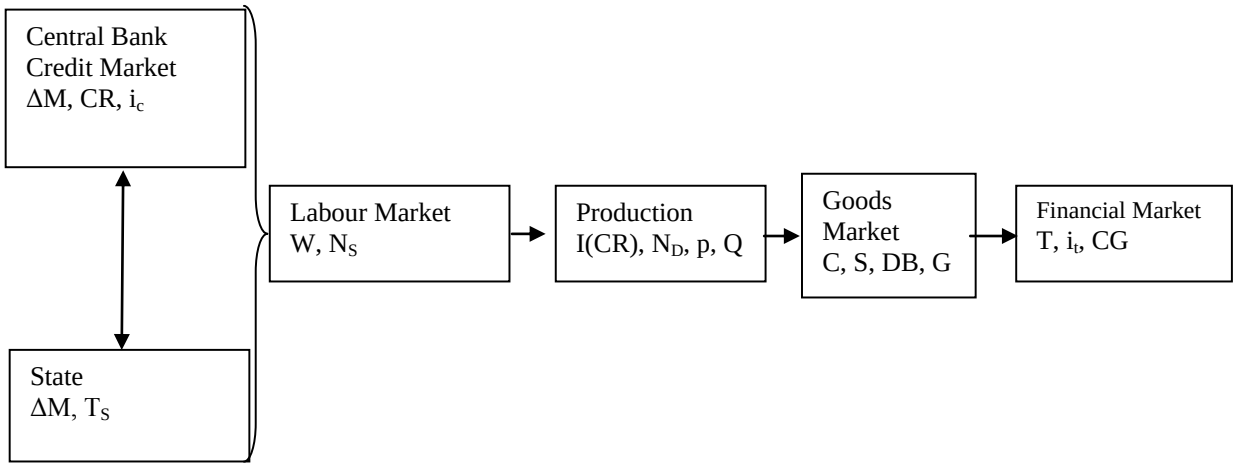
In the circuit schemes introduced by Augusto Graziani, financialization emerges as a scenario linked to the budget results of enterprises. The so-called phenomenon of an increasing weight of the financial sector is explained not so much by a decline in entrepreneurship, but rather by a high government deficit coupled to a credit squeeze.

The analysis of the circulation approach shows that, for finance to increase its weight as compared to production, a fall in entrepreneurial spirit is not enough and that additional technical factors are needed. More precisely:
a) A first condition is the presence of firms having earned profits not only in kind (which would only be a case of self-financed investment) but in the form of money. […] a considerable increase in financial activity to the detriment of real production can only take place in the presence of disequilibria in the balance sheets of single agents: for instance when whole groups of firms suffer conspicuous losses while other groups earns corresponding profits; or in the presence of a considerable government deficit. […];
b) A second condition is also necessary, namely that agents in debt towards the banks be prepared to obtain loans from agents endowed with liquid holdings, thus replacing bank debt by debt towards other agents. This can easily happen when the government tries to finance its own deficit by issuing new securities. The same can happen whenever a credit squeeze occurs and firms having financial problems, and unable to get the required amount of credit from a bank, try to take advantage of liquidity holdings existing in the non-banking sector. It is after all a well known consequence of a credit squeeze that a reduction in the money stock, or in its rate of growth, give rise to an increase in the velocity of circulation.[37]

In other words, financial markets are relevant in the traditional circuit framework only in the closure of the monetary circuit: it plays the role to recuperate the liquidity not collected through the sale of goods. Hence, the financial market could not even operate if money has not been previously created by the credit market, the only one which is able to provide “money ex-nihilo”.

[37] Graziani 2003: 157-158.

Figure 4. Monetary production circuit in fordist capitalism



Legenda

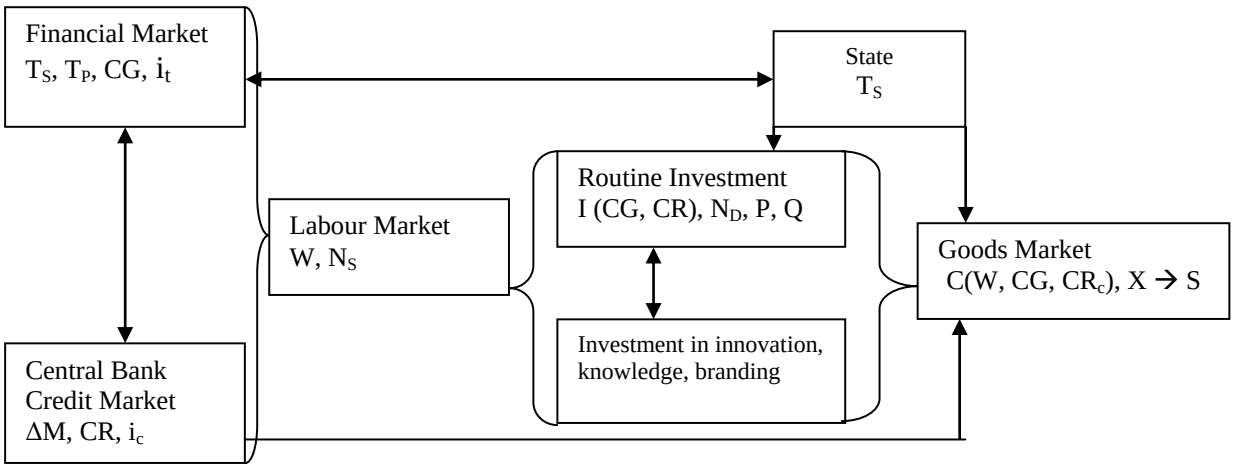
ΔM = Money creation flow (initial finance)
CR = Bank credit
i_c = rate of interest on credit
W = wages
T_S = Public bonds
N_S = Labour supply
I(CR) = Investment activity financed by credit
N_D = Labour demand unilaterally fixed by firms
P = production prices
Q = Output level
C = Consumption
S = saving
DB = bank deposit
G = Public expenditure
T = bonds
i_t = interest rate (or dividend) on bonds and shares
CG = capital gains

3.3 The monetary circuit scheme in cognitive capitalism: towards a financial economy of production scheme

Following the crisis of Fordism and the fall of the Bretton Woods system, money increases its power of control. It's the triumph of virtual money that is no longer tied to the real economy – and therefore to goods – and it mainly assumes a double function.
The former, prevailing in the 1980's, has an *informative* nature. Throughout the 1980's the strong increase of economic uncertainty, that started with the adoption of a flexible rate regime, the downward rigidity of interest rates and the reduction of the referential time horizon (becoming increasingly short term), has facilitated the arising of financial tools (the so called derivative products such as *options* and *futures*) aiming at insuring themselves against risk and pre-dating the deadlines for trading and thus at predetermining the value of the exchange itself. Such operations allow to advance exchanges' liquidity within financial debt and credit operations mainly concerning public securities or operations on the foreign exchange market. Thereby, it's possible to meet an increasingly inescapable need of modern post-Fordist economies, that is to advance the monetary realization of exchanges which may partly concern also merchant activity and thus insure themselves against insolvency or unsold risk. Besides, there is a need to regulate the international financial flows in order to support disciplinary and international hierarchilization mechanisms through processes of discriminant reallocation performed by the financial capital – former credit money already created and now reallocated by saving activities on global scale and aimed at the mere reproduction of money by means of money in the short term (D-D'). This is accompanied by the international concentration of control of monetary and currency policies in supranational bodies that are out of any national political control. Monetary policy authorities exercise a disciplinary power. It can be seen through the European Union 'stability plan' or the so called 'structural adjustment plans' that IFM imposes on indebted countries of the third and fourth world. But such a disciplinary power, especially in the richest areas, is subjected to the dynamics of international capital and foreign exchange markets and therefore it can't manifest itself in absolute terms as it could do in Fordism since it doesn't control the issue of monetary liquidity *in toto*.
As a matter of fact, it's since the 1990's, with the development of the 'Internet Convention', which financial markets start to play a key role in creating virtual money, by now completely dematerialized and therefore subjected to the evolution of conventional and trust mechanisms that are created within the financial markets themselves. To explain the evolutionary process informing today capitalism, the monetary circuit framework must change aspect[38]. In the following pages we propose a financial economy of production. Monetary policy is more and more depending on the dynamics of financial markets and the first goal is to support the creation of positive capital gains as engine to favour economic growth[39]. The institutional channel for money creation becomes less and less important. Public creation of money through deficit social spending policies is strongly reduced. They play a subordinate role according to the dynamics of stock exchange prices in a anti-conjunctural perspective[40]. We face a fourth channel of money creation, after credit channel, State channel and balance of payment: financial market channel. With the shift towards cognitive capitalism, the first two channels become almost irrelevant, whilst the amount of liquidity which is necessary to finance internationalised production depends on the latter two.

[38] Fumagalli and Lucarelli, 2007
[39] If we look at the Fed balance sheet , we can observe that the direct creation of money reached the minimum level in the 2007 just before the crisis: total assets were about 880 billions $ (6,2% of total Usa Gnp), whose the creation of money due to Treasury Securities was about 90% and only 10% was justified by creation of private credit money. This means that the role played by Fed in creating money ex-nihilo has become more and more irrelevant. At December 31, 2008, the Fed total assets reach the level of 2,109 billions $ (14,8% of total Usa Gnp), whose 48% is constituted by credit money creation (1,001 billions $). It is easy to note a sort of substitution effect in the creation liquidity between the credit and the financial market
[40] Public expenditures in Usa increases after the Internet convention collapse, dragged by military reason, too. European restrictive fiscal policy starts to decline after the Chinese-real estate convention collapse.

***Figure 5**. Financial production circuit in cognitive capitalism*



Legenda

ΔM = Money creation flow (initial finance)
CR = bank credit
i_c = rate of interest on credit
T_S = Public bonds
T_P = Private bonds
CG = capital gains (financial money creation)
W = wages
N_S = Labour supply
I(CR) = Investment activity financed by credit
N_D = Labour demand unilaterally fixed by firms
P = production prices
Q = Output level
C(W, CG, CR_c) = Consumption depending on wages and capital gains dynamics
CR_c = credit to consumption
X = esport
S = saving
i_t = interest rate (or dividend) on bonds and shares

i. The opening of the financial circuit

Enterprises enter into debt towards the bank system in order to have the liquidity necessary to the buyout and merger of other firms by pursuing a strategy of growth and control of markets and also to avoid bothersome competitors. In a context of effervescence of financial markets, such strategy leads to an increase in common stock, allowing to earn capital gains able to pay off (more in a virtual than in a real way) the debts previously contracted from the banking system and possibly to accrue profits to be returned or to be used as self-funding to consolidate the productive activity. The realization of accrued capital gains is the condition for creating such a virtuous circle. The growth

of financial markets becomes therefore *conditio sine qua non* for keeping the balance sheet in balance.
This represents a deep change in the funding process of the enterprise activity that it's worth dwelling on. Firstly, it is necessary to point out that the loan agreement provided by the banking system to enterprises is not aimed at the investment activity but rather at financing the buyout of one or more businesses. The purpose of such operation is to take possession of the technologies and know-how that can then entail an increase in the stock value of the enterprise itself. In the last analysis, bank funding becomes necessary to obtain capital gains on the stock market and not to obtain – as in the traditional productive investment activity – monetary profits due to the realization of production on the consumption goods market. In the United States since long time productive and technological investments of the enterprises listed on the stock exchange (capital expenditure) are financed for 98% by the enterprises themselves (self-funding) whereas the expenditures to pay dividends, interests and prospective merger and buyout (mergers & acquisitions, M&A) and buyback are financed by bank loans.
Under a qualitative analysis profile, the relative movement of the monetary creation space from the sphere of the central bank to the sphere of financial markets41 involves a change in the very nature of sovereignty. Whereas bank liquidity creation is pre-eminent, the sovereignty of the nation state is affirmed. Whereas, instead, financial liquidity creation is the priority, it is the sovereignty of the socio-financial convention that historically belongs to it, to be affirmed.

ii. The production process

In cognitive capitalism, as we already pointed out (see par. 2.1), the production process is based on two new elements:

1. The horizontal extension of the basis of accumulation, based on the necessity by firms to use external source of knowledge. The exploitation of intellectual property (IP), notably patents, is increasing "not only by incorporating protected inventions into new products processes or services, but also licensing them to other firms or public research organizations"
But we can add more. External sources of knowledge arise not only by intra-firm relationships but more and more by the human capital, social context, educational processes, diffused general intellect and consumption activity which characterize territory. In this context, accumulation and valorisation do not depend only on the direct production activity, but on the whole material and immaterial production cycle. The role played by advanced services is quite relevant in the direct valorisation process.

2. When social life is one of the sources of the production process, new scale economies becomes more and more strategic in the competitive market economy. They are both dynamic scale economies, related to learning and network processes. Both learning and network economies derive from the inner society. It follows that, as much as production is diffused within a territory, externalities play a different role respect to the Fordist paradigm. Therefore, positive externalities are in CC quite important in order to improve generation (learning) and diffusion (network) of knowledge. They need a special analysis.

In this context, investment activity, at the basis of accumulation dynamics, is composed by two elements. A first one has to do with the traditional investment activity in material production (such as manufacturing goods), the second one with immaterial production (investments in devices of

[41] It has to be noted that this doesn't mean that the financial markets create their own specific currency, different from the one created by the central bank; it means that the central bank in order to create money and to assure the circulation of values, is obliged to follow the movements of financial markets.

production and subsumption of the value produced outside the directly productive processes). In the current regime of accumulation, profits derive from this latter form of investments.

iii. The closure of the financial circuit

Consumption and the demand regime are directly affected by financialization. In order to avoid a demand crisis, the wage de-regulation ought to be compensated upon the wealth effect stimulated by capital gains.
The capital gains of financial markets function as multiplier of real economy just like the deficit spending did during fordism and Keynesian times[42]. If control of the financial activities is distributed in a distorted way, unlike the redistributive effects of the welfare state, the result is an increase in revenue polarization.
The stability condition of the economic system depends on the propensity to invest and the wealth effect, both produced by capital gains allocation.
But when financial gains misrepresent the real effects of investment, dynamic scale economies and static scale economies on productivity, then financial bubbles may emerge.
If the wealth effects generated by the capital gains fail, the facilitated access to credit is used to sustain consumption (CR) and guarantee, even if provisionally, the closure of the circuit. Necessarily, the final result is an ever-growing debt affecting more and more families that leads to an increase in the risk of debt insolvency. Without a mode of regulation that guarantees that the overall produced wealth will be re-invested into the dynamic learning and network economies and without a policy which controls financial bubbles, a finance-led growth is always at risk of instability[43].

4. Preliminary conclusions: the present global crisis

We argued that financial markets are today the pulsing heart of cognitive capitalism. They finance the activity of accumulation: the liquidity attracted to the financial markets rewards the restructuring of production aimed at exploiting knowledge and the control of spaces externalities to traditional business.
Furthermore, in the presence of capital gains, financial markets play the same role in the economic system that the Keynesian multiplier (activated by public deficit spending) did in the context of Fordism. However - unlike the classic Keynesian multiplier - this leads to a distorted redistribution of revenue. So that such multiplier is operative (> 1) it is necessary that the financial base (i.e. the extension of financial markets) constantly grows and that the matured capital gains are on average

[42] Over the 1992-2001 period, the USA experienced the most extensive and longest growth ever seen in the history of capitalism (110 moths) - three months longer than the one registered in Kennedy's time. The average annual growth rate has been between 3.5% and 4%, virtually twofold higher than the European one. On the threshold of the year 2000, 60% of American families had invested their savings in the stock exchange through shares directly owned or purchased through pension funds and common investment funds. In 1989 the percentage was not higher than 30%.

[43] But, in the current situation there are not any economic or political premises sufficient for a new social pact (or New Deal). It is therefore a mere illusion. The Fordist New Deal was the result of an institutional assemblage (Big Government) that was based on the existence of three assumptions: a nation state able to develop national economic policies independent, even if coordinated, from other states; the possibility of measuring productivity earnings and therefore see to their redistribution between profits and wages; industrial relations between social components that were reciprocally recognized and were legitimized on an institutional level, able to sufficiently and unequivocally represent (not excluding margins of arbitrariness) entrepreneurial interests and those of the working class. None of these three assumptions are present in today's cognitive capitalism. No innovative New Deal is possible, if not one that is pushed by social movements and by the practices of autonomous institutionality through the re-appropriation of a welfare system ravaged by private interests and frozen in public policy.

higher than the average wage depreciation (that, since 1975, has been about 20%)[44]. On the other hand, revenue polarization increases the risk of debt insolvency which is at the base of the growth of that same financial foundation and lowers the median wage. Here is a first contradiction whose effects are visible today.
Thirdly, financial markets forcefully, redirecting growing parts of labour revenues (like severance pay and social security, other than revenues that, through the social state, are translated into state health programs and institutions of public education), substitute the state as the principle provider of social securities and welfare. From this point of view, they represent the privatization of the reproductive sphere of life. They therefore exercise *biopower*[45].
Lastly, the financial markets are the place where capitalist valorization is fixed today, which is to say the exploitation of social cooperation and the rent from *general intellect* .
Hence, in a financial economy of production, there is no more separation between the real sphere and the financial one. Financial markets to be able to support phases of expansion and real growth need a constant increase of the financial base. In other words, it is necessary that the share of global wealth redirected toward financial markets continually grows. This implies a continuous increase in the relations between debt and credit, either through the increase of the number of people in debt (the degree of financial market extension) or through the construction of new financial instruments that feed on pre-existing financial exchanges (the degree of intensity of the financial markets). Derivative products are a classic example of this second modality of expansion of the same financial markets. Whatever the factors taken into consideration, the expansion of financial markets are necessarily accompanied both by the increase of debt and by the speculative activities of the risk associated with them. It is an intrinsic dynamic in the role of financial markets as a founding element of cognitive capitalism. Speaking of an excess of speculation due to manager or bank greed has absolutely no sense and can only serve to deviate the attention from the true structural causes of this crisis. Necessarily, the final result is the unsustainability of an ever-growing debt, especially when high-risk sectors of the population begin to be too far in debt: the social strata that, following the process of labour precariousness, find themselves in the condition of not benefiting from the wealth effect that participation in the stock earnings permitted to the more well-to-do social classes. The insolvency crisis in real-estate mortgages thus finds its origin in one of the contradictions of contemporary cognitive capitalism: the irreconcilability of an unequal revenue distribution with the necessity of widening the financial base to continue to push the process of accumulation.
A distorted income distribution does not only penalise the capacity of financial market to keep high aggregate demand dynamics but negatively affects learning and network economies. Consequently, the loss of productivity gains reduces the efficiency of the system.
An enduring uncertainty deeply affects the learning process of the individual and his relational ability, with the result to reduce the impact of dynamic economies upon productive returns.
Aggregate demand is influenced both by the dynamic of the financial markets and by the capital gains deriving from the internationalization of production. With the weakening of the wage-productivity nexus, these dynamics had a greater impact on consumption and the investment activity. In a finance-led economy in order to avoid a demand crisis, the wage regulation ought to be based upon the distribution of capital gains. However, the shortcomings intrinsic to this approach are, firstly, that given the widespread uncertainty generated by working precariousness, knowledge loses its generative capacity, and, secondly, as there is no guarantee that the overall produced wealth will be re-invested into the financial market or elsewhere, a finance-led growth is always at risk of instability.
As far as supply side is concerned, changes in the ability to generate new knowledge, as a basic condition for the spread of new technologies, depend on the characteristics of the environment in which R&D activities are organized. This environment is positively affected by the income level and by a set of variables, such as education, an overall macroeconomic and political stability, fair

[44] See Fumagalli-Lucarelli, 2009.
[45] On this point, see Lucarelli, 2009.

wealth redistribution, a balance between material and immaterial activities, and the existence of a good system of infrastructures, which we define as positive externalities. That is the challenge that also eastern European countries need to face.

References

Andersson J. "Socialising Capital, Capitalising the Social Contemporary Social Democracy and the Knowledge Economy", paper presented to the conference *Debating the Knowledge Economy* at the Institute for Advanced Studies at Lancaster University, August, 2006.

Aglietta M., "The Future of Capitalism", in B. Coriat, P. Petit and G. Schméder, *The Hardship of Nations*, Edward Elgar, Cheltenham-Northampton, 2006: 9-35.

Aglietta M. and A. Rebérioux, "Regulating finance-driven capitalism", *Issues in Regulation Theory*, n. 51, January 2005: 1-5.

Arvidsson A., "The logic of brand", in *European Journal of Economic and Social Systems*, vol. 20, n.1, 2007: 99-116.

Asensio, A., "Inflation targeting drawbacks in the absence of a 'natural' anchor. A Keynesian appraisal of the FED and BCE policies over the period 1999-2006", paper presented at the conference Third International Post-Keynesian conference of Dijon, November, 2007.

Azais C., Corsani A. And P. Dieuaide, (dir), *Vers un capitalisme cognitif?*, l'Harmattan, Paris, 2001

Becattini G. and E. Rullani, "Sistema locale e sviluppo globale", in Becattini G., *Il distretto industriale*, Torino, Rosenberg & Sellier, 2000: 93-116.

Boyer R., "Is a finance-led growth regime a viable alternative to Fordism ? A preliminary analysis", *Economy and Society*, Vol. 29, n. 1, February 2000: 111-145.

Cassi L., "The economic interpretation of knowledge", *European Journal of Economic and Social Systems*, vol. 20, n.1, 2007: 65-80.

Colletis G. and B. Paulré, *Les nouveaux horizons du capitalisme*, Economica, Paris, 2008.

Corsani A., Dieuaide P., Lazzarato M., Moulier-Boutang Y., Paulré B. and C. Vercellone, "Le capitalisme cognitif comme sortie de la crise du capitalisme industriel: un programme de recherche", *Actes du Forum de la Régulation*, 2001.

Fumagalli A., *Bioeconomia e capitalismo cognitivo. Verso un nuovo paradigma di accumulazione?*, Carocci, Roma, 2007.

Fumagalli A. and S. Lucarelli, "Instability and uncertainty in cognitive capitalism", *Money, Finance and Crisis*, C. Gnos and L.-P. Rochon (eds.), Cheltenham, Edward Elgar, 2009.

Fumagalli A. and S. Lucarelli (eds.), "Money and Technological Change. The Role of Financing in the Process of Evolution", Special Issue, *European Journal of Economic and Social Systems*, vol. 21, n. 2, 2008

Fumagalli A. and S. Lucarelli, "A Model of Cognitive Capitalism. A Preliminary Analysis", *European Journal of Economic and Social Systems*, vol. 20, n. 1, 2007: 117-133.

Fumagalli A. and S. Mezzadra (eds.), *Crisi dell'economia globale*, Ombre Corte, Verona, 2009 (fortcoming translation in English: Semiotext(e))

Fumagalli A. and C. Vercellone (edited by), "Le capitalisme cognitive. Apports et perspectives", Special Issue, *European Journal of Economic and Social Systems*, vol. 20, n. 1, 2007

Graziani A., *The Monetary Theory of Production*, Cambridge University Press, Cambridge, 2003.

Graziani A., "Moneta senza crisi", *Studi Economici*, n. 24, 1984: 3-37.

Harvey D., *The Condition of Postmodernity: an Enquiry into the Origins of Cultural Change*. Blackwell, Cambridge, Ma: 1990.

Lucarelli S., "La finanziarizzazione come forma di biopotere", in Fumagalli A, Mezzadra S. (eds.), 2009: 101-120.

Marazzi C., *Capital and Language: Frome the New Economy to the War Economy*, Semiotext(e), Los Angeles, 2008.

Mouhoud E.M., "Global Geography of post-Fordism Knowledge and Polarisation", in B. Coriat, P. Petit and G. Schméder, *The Hardship of Nations*, Edward Elgar, Cheltenham-Northampton, 2006: 293-307.

Moulier-Boutang Y., *Le capitalism cognitif. Comprendre la nouvelle grande trasformation et ses enjeux*, Ed. Amsterdam, Paris, 2007

Nelson R.R. and S.G. Winter, *An Evolutionary Theory of Economic Change*, Belknap Press of Harvard University Press, Cambridge, Massachusetts 1982.

Orlean A., "Knowledge in Finance: Objective Value versus Convention", in Richard Arena and Agnès Festré (eds.), *Handbook of Knowledge and Economics*, Edward Elgar, 2008

Orlean A., "What is a Collective Belief ?" in Bourgine P. et J.-P. Nadal (éds.), *Cognitive Economics*, Berlin, Heidelberg et New York, Springer-Verlag, 2004, 199-212

Prabhakar R., "Markets, Tacit Knowledge and Education", *Economic Affairs*, June 2002: 41-46.

Realfonzo R., "The Italian circuitist approach", in *A Handbook of Alternative Monetary Economics*, P. Arestis and M. Sawyer (eds.), Cheltenham-Northampton, Edward Elgar, 2006, pp. 105-120.

Rossi S., "The theory of money emissions", in *A Handbook of Alternative Monetary Economics*, P. Arestis and M. Sawyer (eds.), Cheltenham, UK & Northampton, MA, USA: Edward Elgar, 2006: 121-138.

Stiglitz J. E., *The Roaring Nineties: A New History of the World's Most Prosperous Decade,* W. W. Norton & Co., New York, 2004.

Venturini F., “How Much does IT Consumprion Matter for Growth? Evidence from National Accounts”, in A. Malgarini and G. Piga, *Capital Accumulation, Productivity and Growth*, London, Palgrave-Mcmillan, 2006: 81–133.

Vercellone C. (ed.), *Sommes-nous Sortis du Capitalisme Industrielle*?, Paris, La Dispute, 2003.

Vercellone C., “Cognitive capitalism and models for the regulation of the wage relation: Some lessons from the anti-CPE movement in France”, paper presented at the conference ‘Immaterial Labour, Multitudes and New Social Subjects: Class Composition in Cognitive Capitalism’ organised by Ed Emery, held in Cambridge on 29-30 April, 2006.

Vercellone C., “From Formal Subsumption to General Intellect: Elements for a Marxist Reading of the Thesis of Cognitive Capitalism”, *Historical Materialism,*15, 2007: 13-36.

Virno P., “Lavoro e Linguaggio,” in A. Zanini and U. Fadini (eds), *Lessico Postfordista*, Milan, Feltrinelli, 2001: 181-85.

Zanini A. and U. Fadini U. (eds.), *Lessico Postfordista*, Milan, Feltrinelli, 2001, “Introduction”, translated in English by Arianna Bove, http://www.generation-online.org/ it/postFordismo.htm